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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

TSANG FOSTER, SUSY N

ART UNIT PAPER NUMBER

1745

DATE MAILED: 02/25/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>		<b>Applicant(s)</b>	
	09/582,432		KATSURAO ET AL.	
	<b>Examiner</b>		<b>Art Unit</b>	
	Susy N Tsang-Foster		1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
  - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
  - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
  - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 04 September 2003 and 21 November 2003.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 2 is/are allowed.
- 6) ☒ Claim(s) 1 and 3-11 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

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## DETAILED ACTION

### *Response to Amendment*

1. The declaration under 37 CFR 1.132 filed 9/4/2003 is insufficient to overcome the rejection of claims 1, and 3-10 based upon WO 97/18596 as set forth in the last Office action because:

The declarant states the following on page 3 of the declaration filed on 9/4/2003:

“The melt extrusion characteristic is represented by an MFR value of approximately 1g/10 min. according to Fig. D, and Fig. D also shows that the MFR value of 1 g/10 min. is given by P(VDF/HFP) copolymer (HFP content=ca. 5 to 7 wt%) having an inherent viscosity  $\eta_{inh}$  of approximately or less than 1.4. Accordingly, I cannot but conclude that the P(VDF/HFP) copolymer (HFP content = 5 wt%) used in Examples 1 and 2 and described to be extrudable at an extrusion die temperature of 230 °C in US'412 had an inherently viscosity  $\eta_{inh}$  substantially lower than 1.4”

In response, the Examiner is unpersuaded by declarant's argument because Figure D shows that the copolymer having an inherent viscosity between 1.4 and 1.8 dl/g has an MFR value of 0.1 g/10 min. to 1 g/10 min. Fig. D does not show for an inherent viscosity greater than 1.7 dl/g a MRF value of 0 g/10 min at 230 °C which would mean that the copolymer is not extrudable. The fact that the MFR value is greater than 0.1 g/10 min. at 230 °C as shown in Fig. D for a copolymer having an inherent viscosity of 1.7 dl/g means that the copolymer with this inherent viscosity value is extrudable according to applicant's extrusion standards.

However, the declarant omitted other factors in the extrusion process known to one of ordinary skill in the art that would affect the extrudability of the copolymer at 230 °C such as the presence of solvent or plasticizer in the copolymer during the extrusion process and the pressure

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at which the copolymer is extruded at 230 °C. Examples 1 and 2 in WO 97/18596 (Equivalent document US 6,284,412 B1 relied upon for translation) do not disclose MFR values for the copolymers. The MFR value of the copolymer being extruded can vary depending on a variety of factors such as the presence of solvent or plasticizer in the copolymer and the extrusion pressure at a given temperature. Therefore, declarant's conclusion that the PVDF/HFP copolymers used in Examples 1 and 2 in WO 97/18596 have an inherent viscosity  $\eta_{inh}$  substantially lower than 1.4 is unpersuasive.

Furthermore, as stated in the previous office action, Gozdz et al. (US. 5,429,891) disclose that a copolymer of vinylidene fluoride and hexafluoropropylene can have a molecular weight ranging from  $100 \times 10^3$  to about  $500 \times 10^3$  (col. 5, lines 44-53) and that the copolymer in combination with a plasticizer can be extruded (col. 7, lines 12-47).

Nevertheless, the declarant's opinions of the extrusion process is irrelevant since the reference WO 97/18596 (Equivalent document US 6,284,412 B1 relied upon for translation) clearly discloses that the preferred molecular weight of the polymer used in the invention of the reference is 1,000 to 10,000,000, and especially from 10,000 to 1,000,000 (col. 14, lines 23-28) and that PVDF and copolymers comprising vinylidene fluoride units are especially preferred (col. 13, lines 64-67 and col. 14, lines 1-5). Vinylidene fluoride/hexafluoropropylene (HFP) copolymer is specifically given as a example of a copolymer comprising vinylidene fluoride units (col. 13, lines 45-47).

The reference discloses that a hexafluoropropylene/vinyl fluoride copolymer resin contains 5 weight percent HFP (col. 26, lines 55-57) as the invention. The molecular weight of the copolymer given in Examples 1 and 2 is not limited by the extrusion temperature of 230 ° C

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since the reference discloses as a whole that the preferred molecular weight of vinylidene fluoride/hexafluoropropylene copolymer is 1,000 to 10,000,000, and especially from 10,000 to 1,000,000 which would have an inherent viscosity value ranging from 0.029 dl/g to 2.87 dl/g (col. 14, lines 23-28 of equivalent document US 6,284,412 B1 relied upon for translation).

Figure C of applicants' amendment filed 4/30/2002 shows that the relationship between the intrinsic viscosity and the molecular weight (average molecular weight) of the copolymer of vinylidene fluoride and hexafluoropropylene can be expressed by the equation  $y = 34.851x - 9.2093$ . When the values of 10,000 to 1,000,000 as disclosed in WO 97/18596, are substituted for y in this equation, the values of x are in the range of 0.029 dl/g to 2.87 dl/g which encompasses and anticipates applicants' claimed range of 1.7 dl/g to 7 dl/g.

Claim 11 has been added. Claims 7, 8, and 10 have been amended. Claims 1-11 are pending. Claim 2 is allowed. Claims 1, and 3-10 are finally rejected for reasons of record which are reiterated below for applicant's convenience. Claim 11 is finally rejected for reasons necessitated by applicant's amendment.

### ***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1, and 3-11 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Gozdz et al. (US 5,429,891).

The product-by-process limitation "obtained by introducing the monomers simultaneously all at once into a polymerization vessel and then polymerizing the monomers" is not given patentable weight in product claim 3.

The product-by-process limitation "wherein the vinylidene fluoride copolymer is crosslinked in the presence of (1) a crosslinking agent selected from the group consisting of polyamines, polyols and polymerizable crosslinking agents having an unsaturated bond, and (2) a radical generating agent" in claim 7 is not given patentable weight.

The product-by-process limitation "formed from a mixture of the vinylidene fluoride copolymer, the nonaqueous electrolytic solution and an evaporatable solvent, by evaporating the evaporatable solvent from the mixture" in claim 10 is not given patentable weight.

The product-by-process limitations of claims 3, 7, and 10 are not given patentable weight since the courts have held that patentability is based on a product itself, even if the prior art

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product is made by a different process (see In re Thorpe, 227 USPQ 964, (CAFC 1985), In re Brown, 173 USPQ 685 (CCPA 1972), and In re Marosi, 218 USPQ 289, 292-293 (CAFC 1983)).

Gozdz et al. ('891) disclose a nonaqueous battery comprising a positive electrode comprising a positive electrode material capable of doping and dedoping (liberating) lithium, a negative electrode comprising a negative electrode material capable of doping and dedoping (liberating) lithium, and a polymer electrolyte between the positive electrode and the negative electrode (col. 1, lines 15-20 and lines 64-65).

The polymer for the polymer electrolyte can be a copolymer of vinylidene fluoride and hexafluoropropylene with about 8 to about 25% hexafluoropropylene by weight and with about 75 to about 92 wt % being vinylidene fluoride and the copolymer can retain about 40 to about 60 % of the electrolytic solution (col. 6, lines 31-40).

The copolymer of vinylidene fluoride and hexafluoropropylene can be crosslinked in the presence of an acrylate ester, a di- or triallyl ester, and a di- or triglycidyl ether (col. 3, lines 40-55) and electron beam radiation (col. 5, lines 20-25).

The vinylidene fluoride/hexafluoropropylene copolymer preferably has a molecular weight which ranges from about  $100 \times 10^3$  to about  $500 \times 10^3$  (col. 5, lines 44-49).

In the amendment filed on 4/30/2002, applicants state on page 5 that the claimed inherent viscosity of greater than or equal to 1.7 dl/g roughly corresponds to  $M_w \geq 500,000$ . Therefore, a vinylidene fluoride/hexafluoropropylene copolymer having molecular weight of about  $500 \times 10^3$  inherently has a viscosity of about 1.7 dl/g.

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With respect to newly added claim 11, about 1.7 dl/g disclosed in the Gozdz reference encompasses 1.8 dl/g. Claims that differ from the prior art only by slightly different (non-overlapping ) ranges are prima facie obvious without a showing that the claimed range achieves unexpected results relative to the prior art range. *In re Woodruff*, 16 USPQ2d 1935,1937 (Fed. Cir. 1990.) See also *In re Huang*, 40 USPQ2d 1685 (Fed. Cir. 1996) (claimed ranges of a result effective variable, which do not overlap the prior art ranges, are unpatentable unless they produce a new and unexpected result which is different in kind and not merely in degree from the results of the prior art).

Since the weight ratio of vinylidene fluoride and hexafluoropropylene used in the copolymer and the inherent viscosity of the copolymer of Gozdz et al. ('891) fall within the ranges claimed by applicants for a copolymer of vinylidene fluoride and a monomer polymerizable with vinylidene fluoride (that is, 80 to 97 wt% vinylidene fluoride and 3 to 20 weight% of at least one monomer copolymerizable with vinylidene fluoride) and no polymerization process is perfect, the properties cited in the instant claims of abnormal linkage content of at least 3% at vinylidene fluoride sites are inherent in the copolymer.

When the Examiner has reason to believe that functional language (abnormal linkage content of at least 3% at vinylidene fluoride sites and an inherent viscosity of 1.7 dl/g or 1.8 dl/g) asserted to be critical for establishing novelty in claimed subject matter may, in fact be an inherent characteristic of the prior art as discussed above, the burden of proof is shifted to the



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applicant to prove that the subject matter shown in the prior art does not possess the characteristics relied upon. In re Fitzgerald et al. 205 USPQ 594.

5. Claims 1 and 3-11 are rejected under U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over WO 97/18596 (Equivalent document US 6,284,412 B1 relied upon for translation).

The product-by-process limitation "obtained by introducing the monomers simultaneously all at once into a polymerization vessel and then polymerizing the monomers" is not given patentable weight in product claim 3.

The product-by-process limitation "wherein the vinylidene fluoride copolymer is crosslinked in the presence of (1) a crosslinking agent selected from the group consisting of polyamines, polyols and polymerizable crosslinking agents having an unsaturated bond, and (2) a radical generating agent" in claim 7 is not given patentable weight.

The product-by-process limitation "formed from a mixture of the vinylidene fluoride copolymer, the nonaqueous electrolytic solution and an evaporatable solvent, by evaporating the evaporatable solvent from the mixture" in claim 10 is not given patentable weight.

The product-by-process limitations of claims 3, 7, and 10 are not given patentable weight since the courts have held that patentability is based on a product itself, even if the prior art product is made by a different process (see In re Thorpe, 227 USPQ 964, (CAFC 1985), In re Brown, 173 USPQ 685 (CCPA 1972), and In re Marosi, 218 USPQ 289, 292-293 (CAFC 1983)).

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WO 97/18596 discloses a nonaqueous battery comprising a positive electrode comprising a positive electrode active material  $\text{LiCoO}_2$  that is capable of being doped with and liberating lithium (col. 29, lines 63-67 of US 6,284,412 B1) and a negative electrode made of coke which is capable of being doped with and liberating lithium (col. 30, lines 7-14 of US 6,284,412 B1); and a polymer electrolyte between the positive electrode and the negative electrode (col. 25, lines 25-30 and col. 30, lines 15-29 of US 6,284,412 B1).

WO 97/18596 discloses that the polymer electrolyte can be a copolymer of vinylidene fluoride and hexafluoropropylene with hexafluoropropylene being 5 % wt in the copolymer and the copolymer can be crosslinked by an electron beam (col. 26, lines 55-65 of US 6,284,412 B1). The amount of nonaqueous electrolyte solution in the polymer electrolyte is 85 % by weight (col. 27, lines 40-45 of US 6,284,412 B1). The copolymer can also be crosslinked by radiation such as an electron beam or by a radical initiator (col. 15, lines 45-55 of US 6,284,412 B1). The copolymer of vinylidene fluoride preferably has a molecular weight of 1,000-10,000,000, preferably from 5,000 to 2,000,000, and more preferably from 10,000 to 1,000,000 (col. 14, lines 23-28 of US 6,284,412 B1).

In the amendment filed on 4/30/2002, applicants state on page 5 that the claimed inherent viscosity of greater than or equal to 1.7 dl/g roughly corresponds to  $M_w \geq 500,000$ .

Furthermore, the Figure C of the amendment shows that the relationship between the intrinsic viscosity and the molecular weight (average molecular weight) of the copolymer of vinylidene fluoride and hexafluoropropylene can be expressed by the equation  $y = 34.851x - 9.2093$ . The values of 1,000-10,000,000 average molecular weight would correspond to 0.0029 dl/g to 28.7

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dl/g according to applicants' equation in Figure C of the amendment which overlaps with applicants' claimed ranges of 1.7 dl/g to 7 dl/g and 1.8 dl/g to 7 dl/g.

Since the weight ratio of vinylidene fluoride and hexafluoropropylene used in the copolymer and the inherent viscosity of the copolymer fall within the ranges claimed by applicants for a copolymer of vinylidene fluoride and a monomer polymerizable with vinylidene fluoride (that is, 80 to 97 wt% vinylidene fluoride and 3 to 20 weight% of at least one monomer copolymerizable with vinylidene fluoride) and no polymerization process is perfect, the properties cited in the instant claims of abnormal linkage content of at least 3% at vinylidene fluoride sites and inherent viscosity having the claimed range are inherent in the copolymer of WO 97/18596.

When the Examiner has reason to believe that functional language (in this instance, the inherent properties of viscosity of 0.0029 dl/g to 28.7 dl/g and an abnormal linkage content of at least 3% at vinylidene fluoride sites) asserted to be critical for establishing novelty in claimed subject matter may, in fact be an inherent characteristic of the prior art as discussed above, the burden of proof is shifted to the applicant to prove that the subject matter shown in the prior art does not possess the characteristics relied upon. In re Fitzgerald et al. 205 USPQ 594.

### ***Response to Arguments***

6. Applicant's arguments filed 9/4/2003 have been fully considered but they are not persuasive.

*With respect to art rejections based on Gozdz et al., applicant asserts on page 4 of the amendment filed on 9/4/2003 that the Kynar Series P(VDF/HFP) copolymers show somewhat*

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*higher molecular weights than expected from their  $\eta_{inh}$  values based on a relationship obtained with the copolymers of the present invention, as shown in previously submitted Fig. C and Table 1 in the amendment filed 4/30/2002. Applicant also asserts that from Figures A and B in the amendment filed on 4/30/2002 that it is apparent that identical copolymers will show higher viscosity values than inherent viscosity values.*

In response, the Examiner is not concerned with the intrinsic viscosity values of the copolymers shown in Figures A and B, but the inherent viscosity values of a copolymer and its relationship to the average molecular weight as shown in Figure C. Furthermore, applicant does not disclose what solvent was used to obtain the relationship between intrinsic viscosity and inherent viscosity in Figure B. Dimethylformamide (DMF) solvent was used in Figure A and therefore cannot be compared to intrinsic viscosity values of Gozdz et al. which were measured in acetone (col. 5, lines 50-52). Applicant themselves stated in the amendment filed on 4/30/2002 on page 5 that "[a]s suggested by the data in Table I, the claimed inherent viscosity ( $\eta_{inh}$ ) level of  $\geq 1.70$  dl/g roughly corresponds to  $M_w \geq 50 \times 10^4$ , and the Kynar-series copolymers (2801, 2822, and 2850) as used in the cited references all exhibited  $M_w$  values substantially lower than  $50 \times 10^4$ ". Gozdz et al. stated that the vinylidene fluoride copolymer preferably has a molecular weight which ranges from about  $10 \times 10^4$  to about  $50 \times 10^4$  (col. 5, lines 44-49) and the copolymer of Gozdz et al. having a molecular weight of about  $50 \times 10^4$  should correspond to about 1.70 dl/g according to applicant's statement on page 5 of the amendment filed on 4/30/2002.

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*Applicant also asserts on page 4 of the amendment filed 9/4/2003 that the Kynar series P(VDF)/HFP copolymers show somewhat higher molecular weights than expected from their  $\eta_{inh}$  values based on a relationship obtained with the copolymers of the present invention, as shown in previously submitted Fig. C and Table I.*

As seen in Figure C in the amendment filed on 4/30/2002, not all Kynar series copolymers show somewhat higher molecular weights than expected from their intrinsic viscosity values based on a relationship obtained with the copolymers of the present invention. Furthermore the fit of the relationship of the intrinsic viscosity to the average molecular weight is quite good with an  $R^2$  values of 0.9802 as shown in Figure C.

*Applicant asserts on page 5 of the amendment filed on 9/4/2003 that it cannot be said with certainty that a MW of  $50 \times 10^4$  corresponds to an inherent viscosity of 1.70 dl/g and applicants have certainly not admitted this to be the case and the present claims are couched in terms of inherent viscosity, not in terms of molecular weight.*

In response, applicant have not experimentally shown that the copolymer of Gozdz et al having a molecular weight of  $50 \times 10^4$  does not have an inherent viscosity of 1.70 dl/g. Furthermore, applicant's own specification states on page 5 '[h]erein, "inherent viscosity" is used as a measure of polymer molecular weight and refers to a logarithmic viscosity number as measured at 30 °C of a solution formed by dissolving 4 g of a polymer resin in 1 liter of N,N-dimethylformamide' [emphasis added].

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*With respect to art rejections based on WO 97/18596, applicant asserts that such a broad range in the reference (i.e. range of 0.0029 dl/g to 28.7 dl/g corresponding to a molecular weight of 1,000 to 10,000,000 anticipates the claimed range of 1.7 to 7 dl/g) raises a presumption of obviousness, and such presumption is overcome by the showing of unexpected superior results achieved in accordance with the present invention, as set forth by the comparative data in the specification as referred to above, establishing the criticality of the claimed inherent viscosity.*

In response, WO 97/18596 discloses that the copolymer of vinylidene fluoride preferably has a molecular weight of 1,000-10,000,000, preferably from 5,000 to 2,000,000, and more preferably from 10,000 to 1,000,000 (col. 14, lines 23-28 of US 6,284,412 B1). Thus, the reference also clearly discloses a narrower range of 0.029 dl/g to 2.87 dl/g corresponding to the range of 10,000 to 1,000,000 disclosed which would also clearly anticipate the range of 1.7 to 7 dl/g since the narrower range disclosed with specificity in WO 97/18596 overlaps from 1.7 to 2.87 dl/g with the broader range claimed. The narrower range of 0.029 dl/g to 2.87 dl/g anticipates the broader claimed range and unexpected results cannot overcome anticipation. The narrower range disclosed in the reference is not broader than the claimed range and therefore a showing of unexpected results is not applicable.

MPEP 2131.03 states:

“PRIOR ART WHICH TEACHES A RANGE WITHIN, OVERLAPPING, OR TOUCHING THE CLAIMED RANGE ANTICIPATES IF THE PRIOR ART RANGE DISCLOSES THE CLAIMED RANGE WITH “SUFFICIENT SPECIFICITY”

When the prior art discloses a range which touches, overlaps or is within the claimed

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range, but no specific examples falling within the claimed range are disclosed, a case by case determination must be made as to anticipation. In order to anticipate the claims, the claimed subject matter must be disclosed in the reference with "sufficient specificity to constitute an anticipation under the statute." What constitutes a "sufficient specificity" is fact dependent. If the claims are directed to a narrow range, the reference teaches a broad range, and there is evidence of unexpected results within the claimed narrow range, depending on the other facts of the case, it may be reasonable to conclude that the narrow range is not disclosed with "sufficient specificity" to constitute an anticipation of the claims. The unexpected results may also render the claims unobvious. The question of "sufficient specificity" is similar to that of "clearly envisaging" a species from a generic teaching. See MPEP § 2131.02. A 35 U.S.C. 102 /103 combination rejection is permitted if it is unclear if the reference teaches the range with "sufficient specificity." The examiner must, in this case, provide reasons for anticipation as well as a motivational statement regarding obviousness. *Ex parte Lee* 31 USPQ2d 1105 (Bd. Pat. App. & Inter. 1993) (expanded Board). For a discussion of the obviousness of ranges see MPEP § 2144.05."

Nevertheless, applicants have not demonstrated unexpected results in the examples described in the specification since all of the examples of the invention are limited to a copolymer having an intrinsic viscosity of 1.7dl/g, 1.8 dl/g, 1.9 dl/g, and 2.5 dl/g and the comparative examples are limited to only a copolymer having an inherent viscosity of 1.2 dl/g. The comparisons also do not involve the same copolymers or same copolymers with the same weight ratio of the vinylidene fluoride monomer to the polymerizable monomer. There is also a huge difference in molecular weight between a copolymer having an inherent viscosity of 1.7 dl/g and a copolymer having an inherent viscosity of 1.2 dl/g since the inherent viscosity is

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related logarithmically to the molecular weight as stated by applicants on page 5 of the specification. There are no comparative examples of a copolymer with 1.5 dl/g or 1.6 dl/g. The examples in the specification are limited to only copolymers having an intrinsic viscosity of 1.7dl/g, 1.8 dl/g, 1.9 dl/g, and 2.5 dl/g and do not sufficiently show unexpected results for entire claimed range of 1.7 dl/g to 10 dl/g.

Applicant's arguments with respect to claims 1, and 3-10 rejected under 35 USC 102/103 based on WO 97/18596 (Equivalent document US 6,284,412 B1 relied upon for translation) has been addressed in the response to amendment section above with regards to Mr. Teramoto's supplemental declaration.

***Allowable Subject Matter***

7. Claim 2 is allowed.

8. The following is a statement of reasons for the indication of allowable subject matter:

The present invention claims a polymer electrolyte comprising a vinylidene fluoride copolymer and a nonaqueous electrolytic solution and the vinylidene fluoride copolymer comprises 80 to 97 wt% of vinylidene fluoride monomer units and 3 to 20 wt % of a mixture of hexafluoropropylene monomer and trifluorochloroethylene monomer and the copolymer has an inherent viscosity of 1.5 to 10 dl/g (applies to claim 2).

The closest prior art of record, Gozdz et al. (US Pat. No. 5,571,634) disclose a nonaqueous battery comprising a polymer electrolyte comprising a copolymer of vinylidene



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fluoride and chlorotrifluoroethylene where the chlorotrifluoroethylene is present about 8 to 20% by weight (col. 6, lines 29-35) but does not disclose, teach, or suggest a polymer electrolyte comprising a copolymer of vinylidene fluoride, chlorotrifluoroethylene and hexafluoropropylene where the total amount of chlorotrifluoroethylene and hexafluoropropylene in the copolymer is 3 to 20% by weight of the copolymer and the copolymer has copolymer has an inherent viscosity of 1.5 to 10 dl/g.

The closest prior art of record, EP 793286 discloses a terpolymer of vinylidene fluoride, hexafluoropropylene, and trichlorofluoroethylene (see page 2) but does not disclose, teach or suggest that the terpolymer has an inherent viscosity of 1.5 to 10 dl/g.

### *Conclusion*

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

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10. Any inquiry concerning this communication or earlier communications should be directed to examiner Susy Tsang-Foster, Ph.D. whose telephone number is (571) 272-1293. The examiner can normally be reached on Monday through Friday from 9:30 AM to 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached at (571) 272-1292.

The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

st/



Susy Tsang-Foster  
Primary Examiner  
Art Unit 1745